Trend Study 19B-2-02

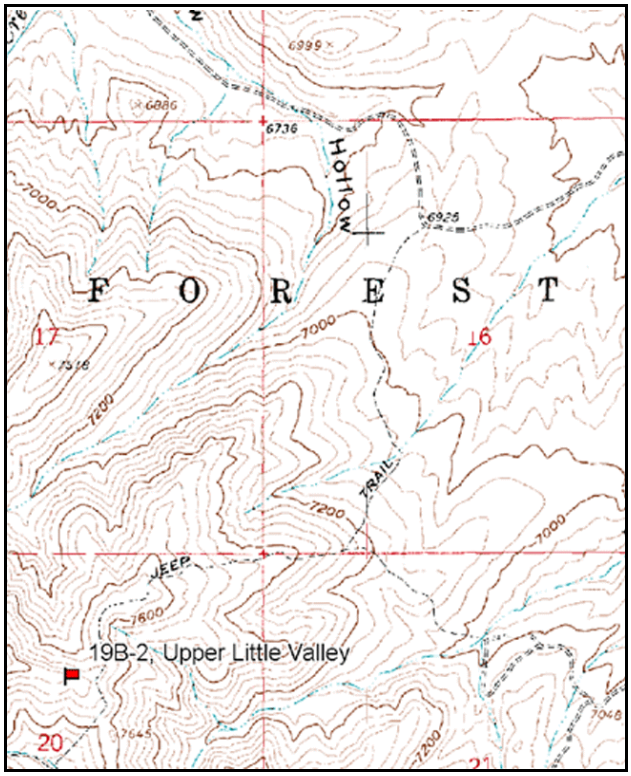
Study site name: Upper Little Valley . Vegetation type: Mountain Brush .

Compass bearing: frequency baseline 188 degrees magnetic (Line 2 @ 195°M, line 3 @ 203°M, line 4 178°M).

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft). Rebar: belt 4 on 4ft.

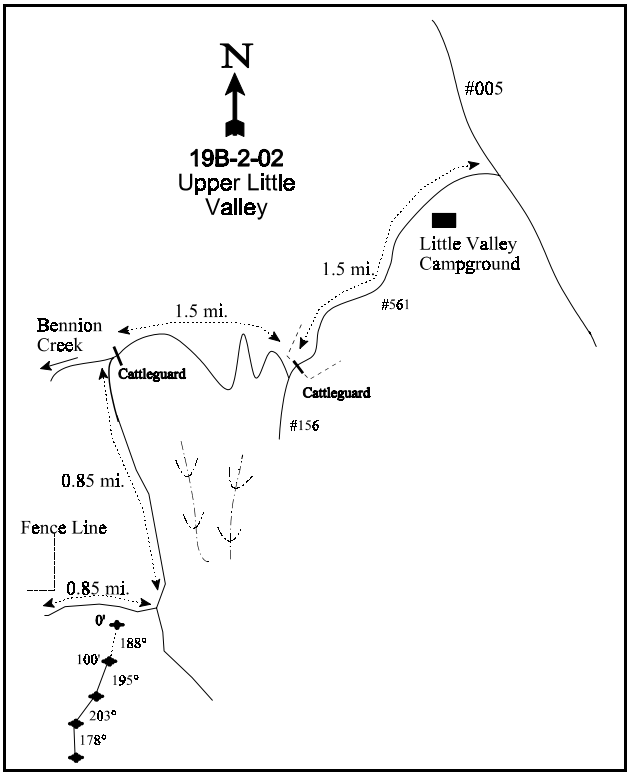
LOCATION DESCRIPTION

The steep, rocky road leading to this study site can be reached on the Little Valley road either by traveling east 2.5 miles from Bennion Creek or west 2.6 miles from the Little Valley Campground. Turn south, and go 0.85 to an intersection. Bear right and continue southerly up the ridge for 0.85 miles to a fence corner on the ridge line. Continue up along the fence to the l9th fencepost. From this fencepost, the 0-foot baseline stake is 33 paces away at an azimuth of 169 degrees. This stake is marked by a red tag, #3928.



Map Name: Dutch Peak

Township 10S , Range 5W , Section 20



Diagrammatic Sketch

GPS: NAD 27, UTM 12S 4422211 N 377844 E

DISCUSSION

Upper Little Valley - Trend Study No. 19B-2

The Upper Little Valley study samples deer summer range near the head of Little Valley. Located on land administered by the U.S. Forest Service, the study is on a moderately steep (25% to 30%), south facing slope at an elevation of 7,300 feet. Numerous intermittent and perennial streams in the area provide good distribution of water. However, thermal and escape cover is inadequate as most of the surrounding area is occupied by low growing shrubs. Only in the canyon bottoms, does vegetation exceed 5 feet in height, an indication of poor site potential on the upper slopes. The site is moderately used by deer, with elk and cattle use being light. A pellet group transect read on site in 2002 estimated 42 deer days use/acre (104 ddu/ha), 8 cow days use/acre (21 cdu/ha), and 2 elk days use/acre (5 edu/ha). Most of the deer pellets appeared to be from winter use. Thirteen deer were observed near the site during the 2002 reading.

The soil is relatively shallow and rocky with numerous basalt rocks and outcrops noticeable in the immediate area. Texture is coarse and well drained. Textural and chemical analysis indicates soils to be a sandy clay loam with a slightly acidic reactivity (pH of 6.2). Effective rooting depth was estimated at 12 inches and soil temperature was 60°F measured at 14 inches in depth. There was little exposed bare soil and ample vegetation and litter cover to protect against erosion during the first three readings. In 2002 however, bare ground increased to 32%, while vegetation and litter cover have both declined considerably due to drought conditions. The erosion condition class was determined as slight in 2002. A moderate level of surface rock movement and soil pedestalling provide the most evidence of erosion on the site.

Mountain snowberry provided 28% of the total vegetation cover on the site in 1997, increasing to 46% in 2002. The increase is due to the greatly reduced herbaceous component in 2002. Snowberry density was estimated at 3,000 plants/acre in 1997, and 2,880 plants/acre in 2002. Age structure changed very little between 1983 and 1997 with about 60% of the population being mature. Decadence peaked in 1989 at 33% (a drought year), but has leveled off to around 15% in 1997 and 2002. Young plants were abundant in both 1983 and 1997, but low in 1989 and 2002, which were both drought years. The proportion of the population displaying poor vigor increased from 11% in 1997 to 35% in 2002. Sixty-one percent of the decadent plants were classified as dying in 1997, decreasing to 25% in 2002. Utilization has been consistently light to moderate through the years.

The most abundant palatable browse on the site is Saskatoon serviceberry which had an estimated density of 640 plants/acre in 1997 and 700 in 2002. These plants were moderate to heavily hedged and exhibited a stable population in 2002. Decadence has been low in most years, with no decadent plants being sampled in 2002. Although young plants were very abundant in 1989, the population has not increased. Vigor was mostly normal from 1983-1997, but poor vigor increased to 49% in 2002. It was reported in 2002 that serviceberry plants were not producing flowers or annual leader growth, and were losing a lot of leaves due to the extremely dry conditions. Tent caterpillars were present on most serviceberry plants in 1983.

Mountain big sagebrush provides additional palatable browse, having an estimated density of 340 plants/acre in 1997 and 520 in 2002. The population consists of mostly mature plants that have been light to moderately hedged. Vigor has been normal for the most part, except during the drought year of 1989, when 56% of the population was classified as having poor vigor. Percent decadence has stabilized at about 20% of the population over the past three readings. In 1983, it was noted that shrub mortality was confined primarily to mountain big sagebrush and could possibly be the result of below-ground feeding by pocket gophers rather than browsing. Sagebrush annual leader growth averaged 1.6 inches in 2002. Other browse sampled on the site include Oregon grape, Martin ceanothus, stickyleaf low rabbitbrush, and prickly pear cactus.

As with the previous study, the herbaceous understory was abundant and diverse prior to the 2002 reading. With drought in 2002, understory species declined in both cover and frequency. The only grass to increase in 2002 was bluebunch wheatgrass. It provided 20% of the grass cover in 1997, increasing to 79% in 2002.

Nearly all other perennial grass species decreased in both cover and nested frequency between 1997 and 2002. This includes mutton bluegrass, Sandberg bluegrass, bottlebrush squirreltail, and mountain brome. Cheatgrass was fairly abundant in 1997, but was rarely sampled in 2002. It appears from photographic comparisons that cheatgrass was much more abundant prior to 1997, but since annuals were not sampled in 1983 or 1989, no comparisons can be made.

The forb component was abundant and diverse in 1983-1997. In 2002 with drought, most forbs were dried up and unrecognizable, and the sum of nested frequency value for perennial forbs declined by 85%. Annual species also drastically declined in 2002. Prior to the drought in 2002, the most abundant perennial forbs included wild onion, longleaf phlox, tapertip hawksbeard, gray lomatium, and tailcup lupine. The most common annual forb species were pale alyssum, slenderleaf collomia, and blue-eyed Mary.

1983 APPARENT TREND ASSESSMENT

Soil trend appears stable to slightly down. Although the current level of soil erosion is not serious, the potential for rapid soil loss is present. Increaser and invader browse species are present but not an imminent threat. Browse trend appears stable. Herbaceous understory trend also appears stable. Forbs, the principal plant species, are doing well with little evidence of change. Grass density is somewhat low, but forb cover tends to make up the difference.

1989 TREND ASSESSMENT

The erosion hazard is high on this site due to a 30% slope and the shallow, rocky soil. There is currently adequate protective ground cover from vegetation and litter to protect the soil. The soil trend is stable. The browse trend is stable as the important species have stable to increasing populations, mostly light to moderate use, and acceptable decadence levels. The herbaceous understory trend is slightly downward with a 39% decline in the sum of nested frequency for perennial forbs, but a slight increase in perennial grasses.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - slightly down (2)

1997 TREND ASSESSMENT

Soil trend is slightly upward with a decline in percent bare ground cover and ample vegetation and litter cover to protect the soil from downslope movement. The overall browse trend is stable. Most of the browse species show stable populations. However, mountain big sagebrush is an exception with more dead plants encountered than living plants, but it only contributes 9% of the total browse cover. This population could be on the way out with no young or seedling plants encountered in 1997. The snowberry population could experience a slight decline in density as 61% of the decadent plants are classified as dying. For now, snowberry has good recruitment by young plants and decadency is low at only 15%. The herbaceous understory trend is stable as sum of nested frequency values for the herbaceous perennials slightly increased.

TREND ASSESSMENT
soil - slightly up (4)
browse - stable (3)
herbaceous understory - stable (3)

2002 TREND ASSESSMENT

Trend for soil is down. With drought in 2002, most of the key soil parameters show negative trends. Bare soil increased to 32%, litter and herbaceous vegetative cover decreased, and the abundance of perennial grasses and forbs declined. Trend for browse is slightly down. Mountain big sagebrush, serviceberry, and mountain snowberry all have stable densities, but reproduction and recruitment is non-existent for all three species, serviceberry and snowberry have increased poor vigor, and serviceberry shows heavy use. The herbaceous understory has a downward trend as sum of nested frequency values for perennial grasses and forbs decreased in 2002. The only important herbaceous species that did not decline on the site is bluebunch wheatgrass which significantly increased. The downward trends on this site are undoubtedly heavily influenced by drought. This will likely improve with normal precipitation patterns in the future.

TREND ASSESSMENT
soil - down (1)
browse - slightly down (2)
herbaceous understory - down (1)

HERBACEOUS TRENDS --
Herd unit 19B, Study no: 2

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
G	Agropyron spicatum	$_{a}$31	$_{a}$49	$_{a}$60	$_{b}$144	12	22	22	58	1.86	4.98
G	Agropyron trachycaulum	3	9	-	-	1	4	-	-	-	-
G	Bromus carinatus	$_{ab}$41	$_{b}$72	$_{ab}$49	$_{a}$32	20	30	19	14	1.17	.66
G	Bromus tectorum (a)	-	-	$_{b}$187	$_{a}$5	-	-	70	3	1.71	.01
G	Melica bulbosa	3	-	8	-	1	-	4	-	.26	-
G	Poa fendleriana	$_{b}$78	$_{b}$78	$_{b}$50	$_{a}$17	33	37	24	8	2.99	.53
G	Poa secunda	$_{a}$-	$_{b}$9	$_{c}$28	$_{ab}$5	-	5	14	2	.66	.03
G	Sitanion hystrix	$_{b}$58	$_{b}$27	$_{b}$25	$_{a}$7	28	13	10	3	.65	.04
G	Stipa lettermani	3	-	3	-	1	-	1	-	.03	.00
Total for Annual Grasses		0	0	187	5	0	0	70	3	1.71	0.01
Total for Perennial Grasses		217	244	223	205	96	111	94	85	7.62	6.26
Total for Grasses		217	244	410	210	96	111	164	88	9.33	6.28
F	Achillea millefolium	1	-	-	-	1	-	-	-	-	-
F	Agoseris glauca	$_{b}$12	$_{a}$-	$_{b}$26	$_{ab}$5	7	-	13	2	.47	.03
F	Alyssum alyssoides (a)	-	$_{a}$21	$_{b}$249	$_{a}$3	-	10	77	3	4.31	.01
F	Allium spp.	$_{d}$182	$_{b}$70	$_{c}$100	$_{a}$-	84	33	47	-	.45	-
F	Aster spp.	-	1	4	-	-	1	2	-	.36	-
F	Astragalus spp.	-	-	7	-	-	-	3	-	.06	-
F	Astragalus utahensis	3	-	-	-	1	-	-	-	-	-
F	Balsamorhiza sagittata	10	17	10	11	6	8	3	5	.82	.54
F	Camelina microcarpa (a)	-	-	11	-	-	-	4	-	.02	-
F	Chaenactis douglasii	3	-	-	-	2	-	-	-	-	-
F	Cirsium neomexicanum	9	8	3	2	4	4	2	1	.21	.03

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
F	Collomia linearis (a)	-	-	$_{b}$88	$_{a}$-	-	-	35	-	.38	-
F	Comandra pallida	$_{b}$81	$_{a}$43	$_{a}$29	$_{a}$24	36	21	14	11	.35	.18
F	Collinsia parviflora (a)	-	-	$_{b}$32	$_{a}$1	-	-	12	1	.06	.00
F	Crepis acuminata	$_{b}$63	$_{b}$59	$_{b}$50	$_{a}$3	33	31	23	1	1.20	.03
F	Cryptantha spp.	4	-	-	-	1	-	-	-	-	-
F	Delphinium nuttallianum	$_{b}$12	$_{a}$-	$_{b}$21	$_{a}$-	7	-	14	-	.15	-
F	Epilobium brachycarpum (a)	-	-	15	22	-	-	7	13	.06	.12
F	Eriogonum racemosum	$_{b}$17	$_{ab}$9	$_{a}$3	$_{a}$-	7	5	1	-	.15	-
F	Hackelia patens	11	10	-	-	4	4	-	-	-	-
F	Heuchera parvifolia	1	-	-	-	1	-	-	-	-	-
F	Helianthella uniflora	3	-	-	-	1	-	-	-	-	-
F	Hymenoxys acaulis	$_{a}$-	$_{a}$-	$_{b}$45	$_{a}$-	-	-	18	-	4.65	-
F	Hydrophyllum capitatum	$_{b}$87	$_{a}$-	$_{a}$-	$_{a}$-	33	-	-	-	-	-
F	Lathyrus brachycalyx	8	-	-	3	4	-	-	1	-	.00
F	Lithospermum ruderale	$_{b}$9	$_{a}$1	$_{a}$3	$_{a}$4	5	1	1	2	.15	.18
F	Lomatium grayi	$_{b}$52	$_{b}$30	$_{b}$49	$_{a}$-	25	16	22	-	1.50	-
F	Lupinus caudatus	$_{c}$78	$_{bc}$72	$_{b}$44	$_{a}$-	35	34	23	-	1.74	-
F	Machaeranthera canescens	1	-	1	-	1	-	1	-	.03	-
F	Microsteris gracilis (a)	-	-	$_{b}$24	$_{a}$-	-	-	9	-	.14	-
F	Penstemon spp.	-	-	5	-	-	-	3	-	.01	-
F	Phlox longifolia	$_{b}$29	$_{b}$43	$_{b}$56	$_{a}$-	15	24	23	-	.63	-
F	Polygonum douglasii (a)	-	-	$_{b}$21	$_{a}$-	-	-	10	-	.10	-
F	Senecio integerrimus	-	9	5	-	-	4	2	-	.18	-
F	Taraxacum officinale	$_{a}$-	$_{b}$21	$_{a}$5	$_{a}$-	-	12	3	-	.12	-
F	Tragopogon dubius	$_{b}$20	$_{b}$30	$_{b}$17	$_{a}$-	10	17	8	-	.07	-
F	Unknown forb-perennial	-	-	-	1	-	-	-	1	-	.00
F	Wyethia amplexicaulis	-	-	5	-	-	-	2	-	.15	-
F	Zigadenus paniculatus	-	-	8	-	-	-	4	-	.02	-
Total for Annual Forbs		0	21	440	26	0	10	154	17	5.08	0.14
Total for Perennial Forbs		696	423	496	53	323	215	232	24	13.54	1.01
Total for Forbs		696	444	936	79	323	225	386	41	18.62	1.15

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 19B, Study no: 2

Type	Species	Strip Frequency		Average Cover %	
		'97	'02	'97	'02
B	Amelanchier alnifolia	22	24	5.56	4.55
B	Artemisia tridentata vaseyana	13	19	2.57	3.16
B	Ceanothus martinii	7	10	.33	.56
B	Chrysothamnus viscidiflorus viscidiflorus	5	5	.93	.33
B	Mahonia repens	1	0	2.66	.51
B	Juniperus osteosperma	25	18	-	-
B	Opuntia spp.	6	5	.15	.15
B	Symphoricarpos oreophilus	66	66	15.70	14.43
Total for Browse		145	147	27.91	23.71

CANOPY COVER -- LINE INTERCEPT
Herd unit 19B, Study no: 2

Species	Percent Cover	
	'97	'02
Amelanchier alnifolia	-	8.00
Artemisia tridentata vaseyana	-	3.33
Ceanothus martinii	-	.42
Chrysothamnus viscidiflorus viscidiflorus	-	.33
Mahonia repens	-	.67
Symphoricarpos oreophilus	-	18.42

Key Browse Annual Leader Growth
Herd unit 19B , Study no: 2

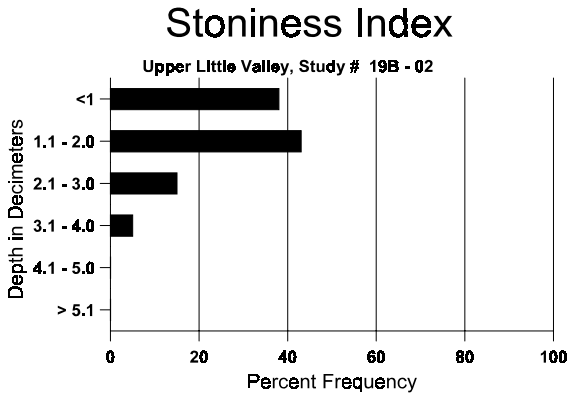
Species	Average leader growth (in)
	'02
Artemisia tridentata vaseyana	1.6

BASIC COVER --
Herd unit 19B, Study no: 2

Cover Type	Nested Frequency		Average Cover %			
	'97	'02	'83	'89	'97	'02
Vegetation	356	260	4.75	10.25	50.93	27.84
Rock	190	216	5.50	9.25	6.74	10.16
Pavement	171	286	3.25	3.25	1.85	10.75
Litter	383	365	71.50	63.50	53.03	38.76
Cryptogams	2	-	0	0	.03	0
Bare Ground	199	316	15.00	13.75	8.91	32.10

SOIL ANALYSIS DATA --
Herd Unit 19B, Study no: 2, Upper Little Valley

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
11.8	59.5 (13.8)	6.2	49.3	27.2	23.6	4.6	13.7	211.2	0.6



PELLET GROUP FREQUENCY --
Herd unit 19B, Study no: 2

Type	Quadrat Frequency		Pellet Transect	
			Pellet Groups per Acre	Days Use per Acre (ha)
	'97	'02	⁄02	⁄02
Rabbit	3	-	-	-
Elk	2	-	26	2 (5)
Deer	26	21	548	42 (104)
Cattle	-	1	104	9 (21)

BROWSE CHARACTERISTICS --
Herd unit 19B, Study no: 2

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Amelanchier alnifolia																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	3	-	1	4	-	-	-	-	-	5	2	1	-	533			8
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	-	6	3	-	-	-	-	-	-	7	2	-	-	600	27	27	9
	89	-	3	2	-	1	-	-	-	-	6	-	-	-	400	32	30	6
	97	5	10	3	2	5	1	3	-	-	28	1	-	-	580	53	55	29
	02	-	-	23	-	-	11	1	-	-	18	-	17	-	700	42	42	35
D	83	-	1	1	-	-	-	-	-	-	1	-	-	1	133			2
	89	2	1	1	-	-	-	-	-	-	4	-	-	-	266			4
	97	-	-	-	-	1	-	-	-	-	-	-	-	1	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	64%	36%	09%	+39%
'89	28%	22%	06%	-47%
'97	50%	13%	03%	+ 9%
'02	00%	97%	49%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	733	Dec:		18%
'89	1199			22%
'97	640			3%
'02	700			0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata vaseyana																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	6	5	1	-	-	-	-	-	-	11	1	-	-	800	21	31	12
	89	10	3	-	-	-	-	-	-	-	7	-	6	-	866	20	25	13
	97	15	-	-	-	-	-	-	-	-	15	-	-	-	300	26	43	15
	02	15	3	2	1	-	-	-	-	-	21	-	-	-	420	22	40	21
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	3	1	-	-	-	-	-	-	-	-	-	4	-	266			4
	97	1	-	-	-	-	-	-	-	-	-	-	-	1	40			2
	02	4	1	-	-	-	-	-	-	-	4	-	-	1	100			5
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	380			19
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	220			11

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	42%	08%	00%	+33%
'89	22%	00%	56%	-72%
'97	00%	00%	06%	+35%
'02	15%	08%	04%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	800	Dec:		0%
'89	1198			22%
'97	340			12%
'02	520			19%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Ceanothus martinii																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	-	7	-	-	-	-	-	-	-	7	-	-	-	466			7
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	4	-	-	-	-	-	-	-	-	4	-	-	-	80			4
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	83	-	4	-	-	-	-	-	-	-	4	-	-	-	266	7	11	4
	89	5	3	-	2	-	-	1	-	-	11	-	-	-	733	8	11	11
	97	5	-	-	1	5	-	-	-	-	11	-	-	-	220	8	27	11
	02	1	-	14	-	-	1	-	-	-	16	-	-	-	320	4	11	16
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	100%	00%	00%	+ 0%
'89	27%	00%	00%	-59%
'97	33%	00%	00%	+12%
'02	00%	88%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	732	Dec:	-
	'89	733		-
	'97	300		-
	'02	340		-

Chrysothamnus nauseosus albicaulis																		
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	24	39	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	0	Dec:	-
	'89	0		-
	'97	0		-
	'02	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus viscidiflorus																		
Y	83	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	89	1	-	-	1	-	-	-	-	-	1	1	-	-	133			2
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	2	-	-	-	-	-	-	-	-	2	-	-	-	133	11	13	2
	89	3	-	-	-	-	-	-	-	-	3	-	-	-	200	13	19	3
	97	9	-	-	-	-	-	-	-	-	9	-	-	-	180	15	32	9
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20	9	18	1
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	7	-	1	-	-	-	-	-	-	4	-	-	4	160			8

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+40%
'89	00%	00%	00%	-46%
'97	00%	00%	00%	+ 0%
'02	00%	11%	44%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	199	Dec:	0%
	'89	333		0%
	'97	180		0%
	'02	180		89%

Juniperus osteosperma																		
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40	-	-	2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	0	Dec:	-
	'89	0		-
	'97	40		-
	'02	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Mahonia repens																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	2	-	-	2	-	-	-	133			2
	97	62	-	-	20	-	-	-	-	-	82	-	-	-	1640			82
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	8	-	-	-	-	-	-	-	-	8	-	-	-	533	5	7	8
	89	13	-	-	3	-	-	-	-	-	16	-	-	-	1066	2	5	16
	97	248	-	-	28	-	-	20	-	-	296	-	-	-	5920	5	7	296
	02	33	-	-	-	-	-	9	-	-	42	-	-	-	840	4	5	42
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	36	-	-	-	-	-	-	-	-	-	-	-	36	720			36
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	160			8

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+58%
'89	00%	00%	00%	+83%
'97	00%	00%	00%	-79%
'02	00%	00%	46%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	533	Dec:	0%
	'89	1265		5%
	'97	7560		0%
	'02	1560		46%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Opuntia spp.																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	2	-	-	2	-	-	-	133			2
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	9	-	-	-	-	-	-	-	-	9	-	-	-	600	6	13	9
	89	8	-	-	-	-	-	-	-	-	7	1	-	-	533	8	22	8
	97	7	-	-	-	-	-	-	-	-	5	-	-	2	140	6	11	7
	02	5	-	-	-	-	-	-	-	-	5	-	-	-	100	5	13	5
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	1	-	-	-	-	-	-	-	-	-	1	-	-	66			1
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+18%
'89	00%	00%	00%	-75%
'97	00%	00%	22%	-44%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	600	Dec:	0%
	'89	732		9%
	'97	180		0%
	'02	100		0%

Pachistima myrsinites																		
Y	83	1	-	-	-	-	-	-	-	-	1	-	-	-	66			1
	89	2	-	-	3	-	-	-	-	-	5	-	-	-	333			5
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	7	-	-	-	-	-	-	-	-	7	-	-	-	466	5	4	7
	89	-	-	-	1	-	3	3	-	-	7	-	-	-	466	2	2	7
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+33%
'89	00%	25%	00%	
'97	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	532	Dec:	-
	'89	799		-
	'97	0		-
	'02	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Symphoricarpos oreophilus																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	7	-	-	-	-	-	-	-	-	7	-	-	-	466			7
	89	1	-	-	1	-	-	-	-	-	2	-	-	-	133			2
	97	19	7	1	6	-	-	2	-	-	33	1	-	1	700			35
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	8	2	-	-	-	-	-	-	-	10	-	-	-	666	19	15	10
	89	7	4	-	3	-	-	-	-	-	13	-	1	-	933	19	22	14
	97	30	20	9	26	4	-	3	-	-	91	1	-	-	1840	25	45	92
	02	92	-	1	25	-	-	6	-	-	89	3	32	-	2480	21	36	124
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	5	3	-	-	-	-	-	-	-	6	-	2	-	533			8
	97	16	4	1	-	2	-	-	-	-	6	1	2	14	460			23
	02	19	-	-	1	-	-	-	-	-	2	-	13	5	400			20
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	12%	00%	00%	+29%
'89	29%	00%	13%	+47%
'97	25%	07%	11%	- 4%
'02	00%	.69%	35%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	1132	Dec:		0%
'89	1599			33%
'97	3000			15%
'02	2880			14%

Tetradymia canescens

M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	19	38	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			
'83	0	Dec:	-
'89	0		-
'97	0		-
'02	0		-